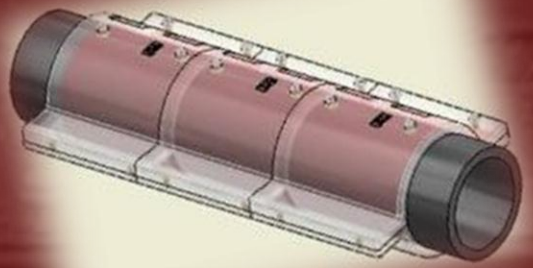
Technology Update



Variable length PE repair Sleeve

2013 Virginia Pipeline Safety Conference

Kevin Gross

MULCARE
Pipeline Solutions

Innovative Products & Services
for Today's Natural Gas Industry

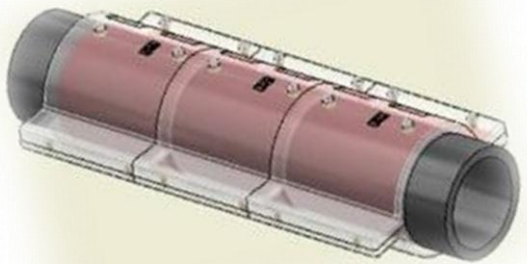
VLRS Product development-Background

-Funded by NYSEARCH and member LDC's

-Followed release of ERP-Elofit Repair Patch for butt fusion joints (Now Butt Fusion Repair Sleeve)

VLRS-Product development-Goals

- Repair deep gouges and scratches
- Repair any length damage
- Provide 360 degree permanent repair
- Rated for up to 124 PSIG
- Reduce repair costs
- Not for blowing gas situations
- Electrofuse with standard equipment



VLRS-Product Development-Phase I

- Wing design required special clamps
- Multiple fusions required

VLRS-Status

- Final version approved by NYSEARCH
- ASTM testing complete
- Product shipped to NYSEARCH member companies
- Currently available for sale in US

  Sizes:

  4 inch available now
  6 inch, 1 QTR 2014
  8 inch to follow

Benefits

Fewer or smaller excavations

No service interruption

No pipe squeezing

No bypass required

Less repair time

Less expensive

Reduced risk and improved safety

Installation

MULCARE Pipeline Solutions

ELOFIT INCHES - 180° VARIABLE LENGTH REPAIR SLEEVE (EIVLRS)

INSTALLATION INSTRUCTIONS

RACC MOD36 USA VER4 EIVLRS

The **VARIABLE LENGTH REPAIR SLEEVE** is a modular system of electrofusion shells that can be installed contiguously and welded on pipes that have notches, scrapes or damage along the axis.

The standard assembly has 2 modules (identified as EIVLRS **I** and EIVLRS **T**): between them it's possible to add the necessary number of additional middle modules (separately available, identified as EIVLRS **M**).

The maximum network pressure allowed to weld the fitting on the pipe depends of the polyehylene grade and SDR of pipe.

POLYETHYLENE GRADE	PRESSURE*
PE4710 PE 100-SDR11	124 psi
PE3408 PE 80-SDR11	60 psi
PE2708/2406 PE80-SDR13.5	60 psi
PE2708/2406 PE80-SDR15.5	14.5 psi
PE80 (ALDYL)	60 psi

* maximum pressure operating during the welding

1 Meaure and mark the length of the damage of the pipe and calculate the appropriate number of sleeve modules to completely cover it.

2 Measure the total length of the sleeve modules and mark it on the pipe, near the damage. ***Minimum distance required for the fitting to extend beyond the damaged area: 2,5" (60mm).***

3 Scrape the part of the pipe where the variable length repair sleeve will be welded, over and all along the damage to be repaired.
Use a hand scraper: scrape the pipe at 180° across the damage. Scrape 0.4" beyond the marked line.

⚠ **TAKE CARE NOT TO DAMAGE THE PIPE FURTHER.**

NUPI Americas, Inc.
1511 Superior Way, Houston, TX 77039 -Tel: 281 590 4471 - Fax: 832 201 8537
Web site: www.nupinet.com - Email:info@nupiamericas.com

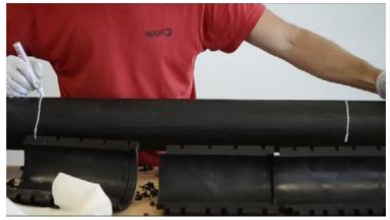
ELOFIT INCHES - 180° VARIABLE LENGTH REPAIR SLEEVE (EIVLRS)

INSTALLATION INSTRUCTIONS

RACC MOD36 USA VER4 EIVLRS

4 Clean the scraped part of the pipe and the welding areas of the sleeve modules with an appropriate approved cleaning solvent and a soft wiping cloth with no printing; wait until the clean parts are completely dry.

5 Mark on the scraped pipe a distance equal to the whole length of the assembled sleeves, so that the damage is well centered and surrounded. Take care not to contaminate the previously cleaned surfaces.



6 Install each single module separately on the pipe, starting from one end of the scraped area: place the EIVLRS **I** module on the pipe and align it to the marked line.

Place the first underclamp on the very end of the assembly: hook the square holes of the underclamp to the teeth on the side of the module; align the two screws to the corresponding holes, line up the metal spacer and use a wrench to tighten the two screws until they are in position **A** in the lower part (feel the screws sticking out of the bottom - *see figure in the circles below*).
Repeat the operation with the second underclamp in the consecutive position.

7 If the middle modules EIVLRS **M** aren't necessary, skip to Step 10, otherwise proceed to the following Step 8.

8 Place the middle module EIVLRS **M** on the scraped pipe, next to the one just installed: the lip at the end of the module must overlap the protruding edge of the next one (*ssee figure in the circles below*). Install the first underclamp across the two adjacent modules (follow the instruction on Step 6).
Then install the second underclamp in the consecutive position (follow the instruction on Step 6).

RECOMMENDATIONS FOR THEIR DISPOSAL:
POLYETHYLENE USED FOR THIS ACCESSORY IS RECYCLABLE: DISPOSE THROUGH AUTHORISED CENTRES.
DO NOT DISPERSE WRAPPING AND PACKAGING OF THE PRODUCT, RECYCLE THROUGH COLLECTION.

EloFIT
(product distributed by- NUPI Americas, Inc.)

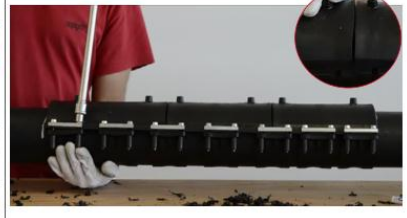
Installation

MULCARE Pipeline Solutions

ELOFIT INCHES - 180° VARIABLE LENGTH REPAIR SLEEVE (EIVLRS)

INSTALLATION INSTRUCTIONS

RACC MOD36 USA VER4 EIVLRS



✓ BEFORE BEGINNING THE WELDING SEQUENCE, ALWAYS CHECK THE RELIABILITY OF THE POWER SUPPLY SYSTEM, TO MAKE SURE THERE ARE NO INTERRUPTIONS DUE TO LACK OF POWER.

✓ THE FITTINGS REQUIRE 4.0mm CONNECTORS.

⚠ DON'T WELD IN CASE OF GAS OR WATER LEAKAGE

⚠ KEEP AT A SAFE DISTANCE DURING WELDING.

⚠ PERFORM WELDING ONLY IN AUTOMATIC MODE THROUGH BARCODE SCAN: DO NOT PERFORM WELDING IN MANUAL MODE.

⚠ ALWAYS CHECK THE WELDING PARAMETERS ON THE DISPLAY.

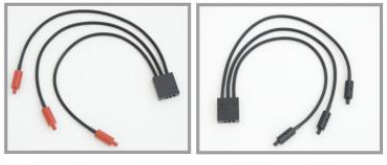
9 Repeat the instructions on Step 8 for all the necessary middle modules EIVLRS **M**.

⚠ **IN CASE OF 4 OR MORE MODULES, PLEASE CONTACT THE SUPPLIER FOR WELDING ASSISTANCE.**

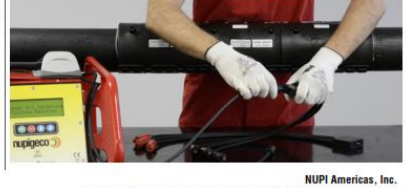
10 Place the terminal module EIVLRS **T** on the scraped pipe, adjacent to the next just installed: the lip at the end of the module must overlap the protruding edge of the next one. Install the first underclamp across the two adjacent modules (follow the instruction on Step 6).
Then install the second and third underclamps in the consecutive positions (follow the instruction on Step 6).
The terminal module EIVLRS **T** must always be the final module installed.

TOOLS (not included):

RED TRIPLE CABLE **BLACK TRIPLE CABLE**



11 Connect one cable of the electrofusion machine to the connector slot on the black triple cable.



NUPI Americas, Inc.
1511 Superior Way, Houston, TX 77039 -Tel: 281 590 4471 - Fax: 832 201 8537
Web site: www.nupinet.com - Email:info@nupiamericas.com

ELOFIT INCHES - 180° VARIABLE LENGTH REPAIR SLEEVE (EIVLRS)

INSTALLATION INSTRUCTIONS

RACC MOD36 USA VER4 EIVLRS

12 Connect each connector of the black triple cable to the first pin marked "A" of each module.

13 Connect the other cable of the electrofusion machine to the connector slot on the red triple cable.

14 Connect each connector of the red triple cable to the second pin marked "B" of each module.

15 Perform welding: scan with the optical pen the barcode marked "ONE-SHOT 2 FITTINGS" (on EIVLRS **I** module) in case of 2 modules, or the barcode marked "ONE-SHOT 3 FITTINGS" (on EIVLRS **M** module) in case of 3 modules, and proceed with welding.

⚠ **IN CASE OF 4 OR MORE MODULES, PLEASE CONTACT THE SUPPLIER FOR WELDING ASSISTANCE.**

16 After the welding cycle is positively completed, mark the actual time on the modules and disconnect all the cables.

⚠ **IN CASE OF WELDING INTERRUPTION DUE TO LACK OF POWER, WAIT FOR THE FITTINGS TO COOL DOWN FOR NOT LESS THAN 1 HOUR, THEN RESTART THE WELDING CYCLE FROM THE BEGINNING.**

17 Wait for the completion of the cooling time indicated on the barcode; then it's possible to move and bury the pipeline.

⚠ **DON'T STRESS OR BURY THE PIPELINE BEFORE THE COMPLETION OF THE COOLING TIME INDICATED ON THE BARCODE.**

RECOMMENDATIONS FOR THEIR DISPOSAL:
POLYETHYLENE USED FOR THIS ACCESSORY IS RECYCLABLE: DISPOSE THROUGH AUTHORISED CENTRES.
DO NOT DISPERSE WRAPPING AND PACKAGING OF THE PRODUCT. RECYCLE THROUGH COLLECTION.

EloFIT
(product distributed by- NUPI Americas, Inc.)